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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,434	02/13/2001	Martin Franz	YOR9-2001-0011US1 (8728-4	9870

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EXAMINER	
JACKSON, JAKIEDA R	

ART UNIT	PAPER NUMBER
2655	2

DATE MAILED: 01/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/782,434	FRANZ ET AL.	
	Examiner	Art Unit	
	Jakieda R Jackson	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 02/13/2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. **Claims 1-3, 5-13 and 15-24** are rejected under 35 U.S.C. 102(e) as being anticipated by Gillick et al. (6,167,377), hereinafter referenced as Gillick.

Regarding **claim 1**, Gillick discloses an Automatic Speech Recognition (ASR) system (figure 1, element 160; column 1, lines 6-7) having at least two language models (variety of language models; column 2, lines 1-5), a method for combining language model scores (column 16, lines 8-11) generated by at least two language models, said method comprising the steps of:

generating a list (figure 11, element 1125) of most likely words for a current word in a word sequence uttered by a speaker (column 1, lines 33-42), and acoustic scores corresponding to the most likely words (figure 9);

computing language model scores for each of the most likely words in the list (column 18, lines 36-39), for each of the at least two language models;

respectively and dynamically determining a set of coefficients to be used to combine the language model scores of each of the most likely words in the list, based on a context of the current word (column 17, lines 39-41); and

respectively combining the language model scores of each of the most likely words in the list to obtain a composite score for each of the most likely words in the list, using the set of coefficients determined therefor (column 16, lines 8-11).

Regarding **claims 2, 12, 20 and 21**, Gillick discloses the method wherein it comprises the steps of:

dividing text data (column 1, lines 8-13) for training (column 15, lines 7-13) a plurality of sets of coefficients into partitions (frames), depending on words counts (time increment) corresponding to the language model (column 1, lines 8-13); and

for each of the most likely words in the list, dynamically selecting (figure 4A, element 405) the set of coefficients from among the plurality of sets of coefficients so as to maximize the likelihood of the text data with respect to the at least two language models (column 4, lines 1-67).

Regarding **claims 3, 13 and 22**, Gillick discloses the method wherein the at least two language models comprises a first and second language model, and said dividing step comprises the step of grouping, in a same partition, word triplets sub.1w.sub.2w.sub.3 (trigram models) which have a count for the word pair w.sub.1w.sub.2 (bigram models; column 1, line 63 – column 2, line 5 and pair of words; column 14, lines 17-32) in first language model (first, second and/or third language

models) greater than the count for the word pair w.sub.1w.sub.2 in the second language model (fourth language model; column 18, lines 16-28).

Regarding **claims 5 and 15**, Gillick discloses the method further comprising the step of, for each of the most likely words in the list, combining an acoustic score (acoustic score) and the composite score (previous score) to identify a group of most likely words to be further processed (column 10, lines 8-14).

Regarding **claims 6, 16 and 23**, Gillick discloses the method wherein the group of most likely words contains less words than the list of most likely words (added to the list of words; column 7, lines 60 – column 8, lines 32).

Regarding **claim 7**, Gillick discloses the method wherein the partitions are independent from the at least two language models (column 2, lines 1-5).

Regarding **claim 8**, Gillick discloses the method further comprising the step of representing the set of coefficients by a weight vector comprising n-weights (interpolation weights), where n (lambda 1 and 2) equals a number of language models in the system (column 16, lines 1-25), to identify the best corresponds to a user's utterance.

Regarding **claims 9, 17 and 24**, Gillick discloses the method wherein said combining step comprises the steps of:

for each of the most likely words in the list (column 1, lines 43-47),

multiplying a coefficient corresponding to a language model by a language model score corresponding to the language model to obtain a product for each of the at least two language models (column 10, lines 16-18); and

summing the product for each of the at least two language models (column 10, lines 8-67), in order to determine the acoustic models that best matches the utterance.

Regarding **claims 10 and 18**, Gillick discloses the method wherein the text data for training the plurality of sets of coefficients is different than language model text data used to train the at least two language models (column 16, lines 26-29).

Regarding **claim 11**, Gillick discloses a method for combining language model scores (column 16, lines 8-11) generated by at least two language models (variety of language models; column 2, lines 1-5) comprised in an Automatic Speech Recognition (ASR) system (figure 1, element 160; column 1, lines 6-7), said method comprising the steps of:

generating a list (figure 11, element 1125) of most likely words for a current word in a word sequence uttered by a speaker (column 1, lines 33-42), and acoustic scores corresponding to the most likely words (figure 9);

computing language model scores for each of the most likely words in the list (column 18, lines 36-39), for each of the at least two language models;

respectively and dynamically determining a weight vector to be used to combine the language model scores of each of the most likely words in the list based on the context of the current word (column 17, lines 39-41), the weight vector comprising n-weights (interpolation weights), wherein n (lambda 1 and 2) equals a number of language models in the system (column 16, lines 1-25), and each of the n-weights depend upon n-gram history counts (R; column 16, lines 42-59); and

respectively combining the language model scores of each of the most likely words in the list to obtain a composite score for each of the most likely words in the list, using the set of coefficients determined therefor (column 16, lines 8-11).

Regarding **claim 19**, Gillick discloses a combining system for combining language model scores (column 16, lines 8-11) generated by at least two language models (variety of language models; column 2, lines 1-5) comprised in an Automatic Speech Recognition (ASR) system (figure 1, element 160; column 1, lines 6-7), the ASR system having a fast match (processor) for generating a list (figure 11, element 1125) of most likely words for a current word in a word sequence uttered by a speaker and acoustic scores corresponding to the most likely words (column 1, lines 33-42) combing system comprising:

a language model score computation device (hardware or software) adapted to compute language model scores for each of the most likely words in the list (column 18, lines 36-39), for each of the at least two language models;

a selection device (recognizer; figure 13, element 215) adapted to respectively and dynamically select a weight vector to be used to combine the language model scores of each of the most likely words in the list based on the context of the current word (column 17, lines 39-41), the weight vector comprising n-weights (interpolation weights), wherein n (lambda 1 and 2) equals a number of language models in the system (column 16, lines 1-25), and each of the n-weights depend upon n-gram history counts (R; column 16, lines 42-59); and

a combination device (select command; column 4, lines 46-50) adapted to respectively combining the language model scores of each of the most likely words in the list to obtain a composite score for each of the most likely words in the list, using the set of coefficients determined therefor (column 16, lines 8-11).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 4 and 14** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gillick in view of Goldenthal (U.S. Patent No. 6,625,749), hereinafter referenced as Goldenthal.

Regarding **claims 4 and 14**, Gillick discloses speech recognition language models but lacks disclosing the method wherein said selecting step comprises the step of applying the Baum Welch iterative algorithm to the plurality of sets of coefficients. Goldenthal discloses the method wherein said selecting step comprises the step of applying the Baum Welch iterative algorithm to the plurality of sets of coefficients (column 2, lines 41-43), for training Hidden Markov Models (HMM's).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Gillick's invention such that it applied the Baum Welch iterative algorithm in order to handle speech problems (column 2, lines 31-32).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Bellegarda et al. (U.S. Patent No. 5,621,809) discloses a computer program product for automatic recognition of a consistent message using multiple complimentary sources of information.
- Wang (U.S. Patent No. 5,950,158) discloses methods and apparatus for decreasing the size of pattern recognition models by pruning low-scoring models from generated sets of models.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jakieda R Jackson whose telephone number is 703.305.5593. The examiner can normally be reached on Monday through Friday from 7:30 a.m. to 5:00p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis I. Smits can be reached on 703. 306-3011. The fax phone number for the organization where this application or proceeding is assigned is 703.872.9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.4700.

TALIVALDIS IVARS SMITS
PRIMARY EXAMINER

JRJ
December 22, 2003